

I claim:

1. A detection system for detecting, locating and classifying an object selected from the group of magnetic and conducting objects, the detection system adapted to detect a secondary magnetic field generated by the object in response to a primary magnetic field transmitted by the detection system, the detection system including an active subsystem for generating an alternating current magnetic field of simultaneous multiple frequencies and a synchronous detection subsystem for accurately measuring the amplitude and phase of the secondary magnetic field.
2. A system according to claim 1 in which the synchronous detection subsystem includes a plurality of sensors, and the active subsystem is adapted to shape the transmitted field in the vicinity of the sensors in order to reduce the sensors' sensitivity to the transmitted field and to desensitize the sensors to movement with respect to the active subsystem.

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